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GREATEST DISCOVERY OF THE AGE!

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CAN BE

RENDERED AS DURABLE

AS

FINGERS AND TOES!

A PLAIN AND COMPLETE EXPLANATION OF THE PROCESS.

By G. E. CORBIN, M. D.

THE DA. DETROIT, MICH.:
STEAM BOOK AND JOB PRINTING ESTABLISHMENT.
1866.

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PREFACE.

To a certain extent we are the creatures of circumstance. The occupation of the man is determined by the surroundings of the boy. As individuals, and as communities, we are influenced, *educated*, by our surroundings.

A large percentage of the individuals in *some* communities fully appreciate the value of the human teeth; whereas, most persons in very many other communities allow their teeth to "rot out," with as little apparent concern as though they were so many "old potatoes." This difference of opinion; this wide difference of regard entertained for the human teeth is not innate, but is the natural result of their different surroundings; the result of the different educational influences that are brought to bear upon this subject.

In the mouths of the former class may be seen tolerably clean teeth with well burnished *gold plugs* inserted "here and there;" the work of *their dental educators*. In the mouths of the latter class may be seen unsightly, blackened, decaying old roots and fragments of teeth; and teeth containing blackening and corroding plugs of silver amalagam. This is the work of *their* dental educators. The instructors in the former instance, are educated and conscientious dentists. Such dentists will always find enough to do in any intelligent community; and hence, seldom have occasion for changing their locations when once established.

The instructors in the latter instance, are unskillful and mercenary pretenders, who, for very obvious reasons, never remain more than a few years in a place; and, indeed, not unfrequently, spend the greater portion of their time in wandering about the country seeking jobs in unsuspecting communities, where the nature of their work and attainments is not known. These men, nevertheless, have their influence. Any one can fill the cavity of a decaying tooth with *silver amalgam*, "silver cement," just as easily as with putty. Any one can cram a greater or less quantity of soft, separate, flaky pieces of gold into the cavity of a tooth; but a "gold filling" of this description, will remain just as long, and no longer; and protect the tooth just as much, and no more; than would be the case were its cavity filled with *crumbs of bread*. On the other hand, if the cavity be thoroughly cleansed of all decaying particles, and then filled with gold by the aid of such instruments, skill and experience as will perfectly condense it into one *solid plug*, fitting air tight against each and every portion of the walls of the cavity; it must be evident to *every* one that the tooth will be materially benefitted, its usefulness prolonged, and the comfort of the patient secured.

The educated and conscientious dentists who can and *do* insert such *solid gold plugs*, are, in these times, very numerous; but the unskillful and mercenary pretenders, who can not, are *vastly more numerous*. As none are better aware of their inability than these pretenders themselves, they give their preference to silver amalgam, or silver cement, and advise their patients to have all, or nearly all their defective teeth filled with it.

These "fillings" will invariably blacken and otherwise injure the teeth. Some of the smaller cavities in the front teeth they will consent to stuff with gold; but as they cannot condense it so as to make solid gold plugs,

the operation will neither exclude the moisture, nor check the process of decay.

As such "fillings" will necessarily crumble out in the course of a few weeks, or months at most, the patient very naturally concludes that "silver" makes a better "filling" than gold. With such instructors, and such experience, what wonder that large numbers of the community lose all confidence in dentists and dental operations. Viewed from this stand point, it is not surprising that so many are delighted at the extraction of their last tooth; because, as they express it, they can now have teeth that will not ache.

The whole of their unfortunate experience in this direction serves but to convince them that all natural human teeth are worse than useless! Indeed, they have not unfrequently been heard to express surprise that such worthless and painful organs should ever have been created! Their constant anxiety, therefore, is to get rid of these offending members, that they may *buy* better ones. That appropriate artificial teeth are vastly better than no teeth, needs no argument, and that a complete set of natural, healthful, human teeth is immensely better than artificial ones, must appear equally obvious to every one.

The object, then, of this little treatise, is two-fold; first, to check, and if possible, entirely avert the present wholesale slaughter of the human teeth. *The second and great object, is to teach all who will give heed, how to preserve their natural teeth in good condition, throughout the entire period of their natural lives.*

The value of a thorough knowledge of this Greatest Discovery of the Age, cannot be computed in dollars and cents. Perhaps no one person ever did more toward the advancement of human knowledge and the amelioration of the condition of his fellow mortals, than

did Benjamin Franklin. He made a number of important and valuable discoveries, the *most* important of which is the *astonishing fact* that *sunlight is cheaper than artificial light!* and furthermore, that "THE SUN GIVES LIGHT AS SOON AS HE RISES!!" In his own language, he says: "This is what I claim as my discovery. If the ancients knew it, it must have been long since forgotten, for it certainly was unknown to the moderns, at least to the Parisians, which to prove, I need use but one plain, simple argument. They are as well instructed, judicious and prudent a people as exist anywhere in the world, all professing, like myself, to be lovers of economy; and from the many heavy taxes required from them by the necessities of the state, have surely reason to be economical. I say, it is impossible that so sensible a people, under such circumstances, should have lived so long by the smoky, unwholesome, and enormously expensive light of candles, if they had really known that they might have had as much pure light of the sun for nothing."

Dr. Franklin made this discovery in the year of our Lord 1784, while residing at Paris, in the capacity of Minister Plenipotentiary to the French court. He immediately reduced it to a proper form, with statistics, etc., and caused it to be inserted in one of the daily papers of Paris; but failed to convince the Parisians of the fact, for the simple reason that he did not adopt a course best calculated to arrest their attention. Valuable as is this discovery of Benjamin Franklin, it holds no favorable comparison to the great value of the discovery with which I am about to acquaint you. While his discovery is simply in relation to the matter of a pecuniary saving; mine has for its *very foundation*, the peace, happiness, comfort, beauty, and health of the great masses of human beings.

What is the *value* of upwards of *sixty-four thousand*

tons of wax and tallow annually consumed in the city of Paris alone, at that early date, over midnight revels ; to be compared with the millions of human teeth that are annually allowed to "rot out" unnecessarily ? Neither argument nor illustration is necessary to convince the reader of the vast importance of the subject now under consideration. What would be the effect were some horrible pestilence to rapidly sweep over the face of the whole civilized world, causing three quarters of all the human fingers and toes to gradually rot off ? Such a calamity would be startling in the extreme ; and yet I doubt if it would be productive of any more harm in the direction of inflicting misery, destroying beauty, and impairing general health, than is the case with the present and almost universal process of destroying and ejecting the beautiful and valuable teeth an all-wise and beneficent Creator has been pleased to provide us with. It is not reasonable to suppose that our Creator intended the one set of organs should occasion us any more misery, or render us any less service, than the other. The Creator's works are all perfect. Our teeth were designed to serve us as long as we need teeth—*designed to be as durable as our fingers and toes ;* and if, kind reader, you will give careful attention to the following pages, you shall soon learn how to render them so.

I.

In the first place, gentle reader, let us suppose that you are the mother of a family. You are also dependent upon artificial teeth.

"Yes, I lost my teeth young,—can hardly account for it,—my father had scarcely a defective tooth in his mouth at the time of his death, at the age of seventy ! He chewed tobacco. Doctor, don't you think tobacco preserves the teeth ?"

I can not say that I am aware of any property of tobacco, calculated to exercise the least beneficial influence in that direction.

"Well, I did not know. He always thought it what preserved *his* teeth. He never took any especial pains with his teeth,—never brushed them,—in fact, none of us ever did that! 'To tell the truth,' we did not know that it was considered necessary until about the time I lost the last of mine."

Your father was probably a man possessed of a good constitution, and doubtless, in most respects, temperate in his habits.

"Yes indeed. His occupation was such that he could, and his inclination such that he did, always take his meals and sleep at regular hours. He never indulged in the use of intoxicating drinks, and seldom, in the use of tea or coffee. He said mince pies, hot bread, hot cakes, and other similar articles of food, might gratify the palate, but in his case, at least, they offended the stomach; and hence, he discarded them. I believe his only dissipation was in the use of tobacco."

Am I to understand you that your father never adopted any course whatever, calculated to keep his teeth clean?

"He never brushed his teeth, but I well remember that he was always very diligent in the use of his tooth pick after each meal. Aside from the fact that his teeth were always more or less stained with tobacco juice, he may be said to have kept them tolerably clean."

I think I may venture the opinion that his teeth were not very closely crowded together.

"No, there were quite distinct spaces between his teeth; very different from mother in that respect. Her teeth were very much crowded and irregular, and covered with 'scurf.' She was a great martyr to the toothache.

I have known her 'perfectly down sick' with it for a week at a time. Many of her teeth were badly decayed, and yet several of them became so loose that she picked them out with her fingers, while they were yet perfectly sound!"

You have given no account of the loss of your own teeth.

"Oh! I had such nice, regular, white, perfect teeth—it distresses me to think of their loss now. My teeth all went at once. I was not aware that I had a defective tooth in my mouth, until most of them were more or less decayed. It was then too late—did no good to fill them—I had several filled but they ached soon after—fillings came right out."

You have little children for whom you find it necessary to provide clothing. Suppose your seamstress should be so careless in the making up of their garments, as that a few days wear would cause them to drop in pieces and leave your children entirely naked! Would that be a sufficient reason why you should make no further effort to shield them from the inclemency of the weather?

"It is needless to state that I now fully appreciate the force of your explanatory question. When I had my teeth extracted, preparatory to the insertion of artificial ones, I had almost half a dozen perfectly sound teeth on either jaw. My dentist (?) argued that my sound teeth would last but a few years at best, that I might better have them all out at once; make a 'clean sweep' of it and have in some teeth that will never ache. I was influenced by his advice, and accordingly lost my teeth. I have since thought that a thorough and conscientious dentist would have saved my natural teeth, instead of making so great an effort to procure the job of inserting artificial ones."

The fact that your "dentist" advised you to make a clean sweep of it, and have out a dozen "perfectly sound" natural teeth, for the sake of having them replaced by artificial ones, is proof positive, that he was *not a conscientious person.* With a full knowledge of this fact, we are at perfect liberty to infer that the labor he bestowed upon your natural teeth, was not such labor as the nature of the case demanded. I presume it will require no argument to convince you that your sound and beautiful natural teeth should not have been extracted.

"No one can be more thoroughly convinced of that fact than I am; but, doctor, what *could* have been done with my *un*sound teeth?"

This last question of yours, my dear madam, rather anticipates my predetermined arrangement; nevertheless, as an answer to it will the better prepare your mind for what is to follow, I will give it in this place. Each tooth has a body or crown, neck, and root. Observe the one I hold in my hand. That portion which, in health, projects above the gum, is called the *crown.* In length, it usually constitutes about one-third of the tooth. The other two-thirds, constituting the *root,* are embraced by the bone of the jaw, and the gum surmounting it. The place of union between the crown and the root, frequently, though not always, marked by a sort of constriction, is called the *neck* of the tooth. At the neck of this tooth you will observe what appears like a seam running entirely around the tooth. Close inspection will reveal the fact that this seam-like appearance is caused by the junction of two different substances. The principal part of a tooth, in character and composition, is very much like ordinary bone. *Did you ever see a man with his bones all on the outside?* Nature takes great pains to cover the bones, and protect them from the atmosphere and all other irritating substances. This bony part of a tooth is called dentine.

FIG. 1.

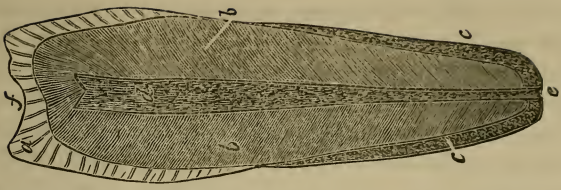


Fig. 1 represents an enlarged view of a vertical section of a human tooth; *a*, the enamel; *b*, the dentine—the white line at *b* is situated at the junction of enamel and cementum; *c*, the cementum; *d*, the pulp cavity; *e*, the orifice of the canal leading to the pulp cavity; *f*, the grinding surface of the crown.

The *dentine* of the crown is entirely capped over by a hard and smooth substance called *enamel.* The *dentine* of the *root* is covered by a substance called *cementum.* The seam-like appearance at the neck of the tooth, is caused by the junction of these two substances, *enamel* and *cementum.* The enamel is the hardest of all animal substances, and is not endowed with sensibility, as it may be filed without causing pain. It is always thickest on that portion of the tooth which is most exposed to friction. The cementum is a vascular and sensible substance, spread upon the roots of the teeth in a very thin stratum. It appears to be an intermediate and connecting link, between the dentine, which is less vascular, and the surrounding flesh, which is more vascular.

"But doctor, why do you make no mention of the 'nerve of the tooth?' I am sure any one who has had the toothache, would be most interested in a description of that?"

Tut! Tut! Please pay particular attention. I will come to that point directly. This description is of *vital importance*, if I am to give a correct and satisfactory answer to your question in relation to what might have been done with your decaying teeth. What is invariably alluded to in the common phrase, "nerve of the tooth,"

is, strictly speaking, the *pulp* of the tooth. The pulp consists of an innumerable number of minute nerve fibers, and minute blood vessels, all commingled in one small and compact bundle. This is situated in a chamber, called the pulp-cavity, in the central portion of the crown of the tooth. This pulp, this bundle of nerves, is in direct communication with the brain, through the instrumentality of minute nerve fibers threading a canal in each root of the tooth. Whenever this pulp is encroached upon by foreign substances, the impression is instantaneously conveyed to the brain, and unmistakable "tooth-ache" is the result.

Before the process of decay actually exposes the pulp, so as to cause *excrutiating pain*, there is, generally, a protracted *soreness*. The tooth is capricious. Though quiet most of the time, it is extremely sensitive to sudden changes of temperature. Sweet or sour substances, coming in contact with the *exposed dentine*, cause pain. All persons with sound and healthful teeth are aware that sweet, or moderately sour substances, do not cause their teeth to ache. Such teeth, you will recollect, have nothing but *enamel* exposed. It is only when the process of decay has perforated the enamel, and exposed the *dentine*, that teeth become *sore*.* It is only when the process of decay has perforated both the enamel, and the dentine, and exposed the *pulp*, that teeth become *excrutiatingly painful*.

Do not fail to observe the order and wisdom of this arrangement. First comes the enamel, the hardest and most indestructable part of the tooth, covering and protecting the more vital and sensitive structure beneath. The enamel is so hard and thick, as, when properly cared

* I am speaking now more especially in reference to the *crown*. If the gum have receded so as to expose the *cementum*, it, like the dentine, may become very sensitive.

for, to withstand the wear and friction of masticating food for a life time. Notwithstanding this hardness, certain substances very easily disorganize it,—render it soft, brittle,—cause it to crumble, *decay*, or, in the language of many, "to rot." Acids of various kinds are the substances most likely to produce this result. Tartaric acid, lemon juice, cranberries, strong vinegar, currants, sour apples, and all other articles that "set the teeth on edge," do it by virtue of softening the enamel. The mouth and teeth, therefore, should always be thoroughly rinsed with pure water, or even with an alkaline solution, immediately after making use of any such articles of food. Persons who are so negligent as to allow particles of food, such as apple skins, raisin skins, shreds of meat, &c., to lodge and remain between their teeth for any considerable length of time, will invariably find their teeth have suffered much harm in consequence. These foreign substances, when subjected to the warm temperature of the mouth, readily undergo decomposition. In this process acids are generated, which readily attack the enamel, and cause it, also, to rapidly decay. During the process of the destruction of the enamel, the patient is generally unconscious of its condition. As soon as the sensible dentine becomes exposed, nature arrests the attention of the patient. In the plainest of language she says, "Your tooth is diseased; attend to it at once, and cause it to be healed. Replace the enamel by gold or some other substance. Cover the dentine so thoroughly as to protect it from all possible contact with moisture, and the atmosphere, and you will be comfortable again." Thus is the patient kindly and constantly admonished, for days, weeks, months, and sometimes even for years.

"For years! yes, indeed, and even then not heed the admonition!" "Would you believe, Doctor, that I, even, censured Nature for the inconvenience I suffered, when,

as you have just explained, she was kindly calling my attention to the irreparable loss I was about to sustain ?"

Such, my dear madam, is too frequently the case. Nature is very kind, very patient, very enduring; but there is a point, beyond which forbearance ceases to be a virtue. That point is attained whenever both the enamel and the dentine are perforated, and the *pulp exposed.* Nature then exclaims, "you heeded not my admonitions; you continued to transgress my laws; you must now suffer the just penalty of your iniquity." Nature's laws are immutable. Punishment just as unavoidably follows transgression, as does any other effect necessarily follow its cause. With a knowledge of this indisputable fact, it is remarkably strange that any intelligent being should neglect to take just as good care of the *bones in the teeth*, as of the *bones in the fingers!* Let us for a moment suppose, some accident, which tears the flesh from the finger, and exposes the bone to a limited extent. Nature arrests the attention of the patient. In the plainest of language she says, "your finger is injured; attend to it at once, and cause it to be healed. Cover the wound so thoroughly as to protect it from the atmosphere, and all other irritating substances, and you will be comfortable again." In this case, the admonition is heeded. Now, why this difference? The only solution that I can give, is the following: In the one instance, the patient feels convinced that proper care will restore the finger; in the other instance, the patient *believes* that the tooth *can not* be restored to health, comfort and usefulness.

These different opinions are the results of the different educational influences that have been brought to bear upon the patient. Most of the injured fingers falling under the observation of the patient, have been saved; and most of the decaying teeth, lost. Many of these teeth have been thoroughly and properly treated by dentists,

and lost entirely in consequence of the subsequent neglect of the patients. Many of these teeth have been very tolerably cared for by the patients themselves, and lost in consequence of the inefficient and detrimental treatment received at the hands of dental quacks. Most teeth are lost in consequence of the extreme and unaccountable negligence of the patients only.

II.

I will now proceed to answer your question in relation to what might have been done with your decaying teeth. From the preceding, extended preliminary remarks, I presume you are almost prepared to answer the question yourself.

"I think I can anticipate *your* reply; or rather, I think that, in substance, you have already answered the question. You advise that the exposed dentine be covered; be protected; or, in other words, that the cavity be filled. I caused the cavities in my own teeth to be filled, but I have yet to be convinced that it was of any especial advantage."

Very true. You had the cavities "filled," but it does not seem that you had the dentine *protected*, as you say the fillings came right out. Now, it is a fact that *some* defective teeth can be rendered *nearly perfect* again; while others can not be benefited as much, and still others can not be benefited in the least. These different results, —all other conditions being the same,—are dependent upon the extent to which the teeth have been deprived of *vitality*, at the time of the operations. To illustrate: Select three apples. Two months ago each was large, fair, sound, delicious, perfect. Now, one is bruised a little upon one side. The bruised portion is spongy, and perhaps tasteless; certainly, not fit for use. Excavate the

defective portion, and the remainder may be just as fair, sound and *delicious* as ever. About one-third of the second apple is now a soft mass of corruption. Remove this, and the remaining portion may not appear different to the eye from what it did two months ago. The sense of taste, however, unmistakably reveals the fact that it has been permeated by,—that it has been *perfectly infiltrated with*,—the more minute particles of the decaying portion. The third apple, though it still retains nearly its original external shape, has been so far disorganized as to be worthless. Indeed, it is "worse than useless," as its exhalations are contaminating. Teeth, which, in relation to the *contiguity* of diseased and healthy parts, are allied to the first apple, can be rendered very nearly perfect again. Teeth, which, in relation to the *continuity* of parts most and least diseased, are allied to the second apple, can be so repaired as to be of material service again. Teeth, which, in relation to their utter uselessness, are allied to the third apple, infect the adjacent teeth, taint the breath, and impair the general health of the patient. SUCH TEETH SHOULD BE EXTRACTED WITHOUT DELAY.

Whoever entirely disregards both honesty and professional reputation, and fills teeth solely for the pay, will fill all the cavities he can find, (with amalgam, doubtless,) in all three of the above classes of teeth. The patient will very soon lose all the fillings, and most of the teeth. Whoever makes the interest of the patient entirely secondary to his own reputation for filling teeth, will fill only such as he has no doubts about, and advise the patient to have out all about which doubts might be entertained. Any thoroughly qualified dentist, who believes that "honesty is the best policy," will have no trouble in understanding that the interests of his purse and reputation will be best subserved by consulting the best inter-

ests of his patients. He will endeavor not to subject the patient to the expense of filling teeth which can not be benefited thereby; and, at the same time, will strive to save all that can be saved. This position necessitates a careful discrimination; a discrimination not possible with that class of pretenders whose only claim to professional dignity is based upon their ability to fill an auger-hole with putty, or the cavity in a decaying tooth with amalgam. The dividing line between teeth that will, and those that will not pay for thorough repairs, may be mistaken, even, by those who are thoroughly conversant with the laws that govern vital forces, physiological and pathological conditions. All graduates of regular medical colleges, and all graduates of regular dental colleges, have necessarily pursued the appropriate course of study, and consumed the requisite amount of time, in which to qualify themselves to judge of vital forces, chemical and mechanical principles, and all the numerous physiological and pathological conditions, unavoidably encountered in an extensive and protracted dental practice. If such of these persons as are endowed with a large amount of caution, must needs, sometimes mistake certain vital conditions, what is to be expected at the hands of those who have dubbed themselves doctors, or dentists, by virtue of a three months' apprenticeship at sweeping the offices of similarly self-constituted doctors, or dentists?

"But, doctor, do you not depart from your text? You will recollect that you were to tell me what might have been done with my decaying teeth?"

I never saw your natural teeth, and hence I am unable to particularize. I have already stated that the process of decay should be arrested, by *protecting* the exposed surfaces from further irritation. I have endeavored to give you a general idea of *some* of the processes resorted to for this purpose; leaving it for you to make the

application in your own case. It is strange that any should, yet many do, lose sight of the fact that *protection* is the object of filling teeth. There is no *charm* about filling teeth,—there is nothing enchanting. There is no strange Abracadabra in the process. Teeth once properly "cleaned and filled," are not proof against injury by all sorts of misuse and neglect, any more than a building, once insured against loss by fire, is thereby rendered fire-proof. Natural laws, *only*, are involved in these premises. He who possesses the best knowledge of natural laws, together with most skill and most conscience, will produce the best results in the mouths of his patients. Such of his patients as possess the best knowledge of natural laws, together with most energy, and most conscience, will so manage as to retain these results in their mouths for the greatest length of time. I do not intend, gentle reader, to discuss all subjects appertaining to dentistry; neither is it my intention to discuss any one at length. You will call to mind that I stated in my preface, that I have *two* particular objects in view in writing this little treatise. *My first object is to check, and, if possible, entirely avert the present wholesale slaughter of the human teeth.* To accomplish this object, I have just simply *two* things to do. The *first* thing to be done, is to *convince* the community that a large percentage of their present defective teeth can be saved. The *second* thing to be done, is to teach them how to do it.

"I think, doctor, that your careful description of the structure of the teeth, together with your lucid rationale of the process of decay, already given, are amply sufficient to accomplish the object in your *first* thing to be done; I, at least, need no further argument to be convinced of the fact. The *one great consideration*, now, would seem to be, to *so discriminate*, as to employ *only such dentists* as are both *competent* and *willing* to do *efficient work*."

The mode of discriminating between *dentists*, and *pretenders*, will incidentally appear in the remarks I am about to make concerning the size, situation, and nature of the cavities to be filled; the substances and their properties with which the cavities are to be filled; and the different modes of introducing those substances.

III.

Bearing in mind that *protection** is the object of filling teeth, all will at once see the great necessity for a careful attention to the seven following considerations:

1st. The cavity should be thoroughly cleansed. All diseased particles of the substance of the tooth, should be carefully removed.

2d. Such grooves, or retaining points, should be excavated in the walls of the cavity, as will make it certain that the filling, when once thoroughly impacted, will be retained.

3d. The cavity should be rendered *perfectly dry*, and should be so protected as to *keep it perfectly dry*, throughout the entire operation of plugging. In some situations in the mouths of some patients, this is decidedly the most difficult object to be accomplished, in the whole process of filling teeth.

4th. Such a material as is best adapted to the various circumstances and conditions, should be selected with which to fill the cavity.

5th. The material should be inserted, a little at a time. The successive portions should be firmly pressed, not only towards the bottom of the cavity, but also towards its lateral walls. This process should be continued until the cavity is filled, and its contents *pefectly consolidated* throughout its *entire extent.*

* Protection from moisture, atmospheric air, and all other iritating substances.

6th. The protruding portions of the material with which the cavity has been filled, should be filed away in such a manner as to restore the original rotundity of the tooth.

7th. The surface of the filling should be thoroughly burnished. This not only gives a finished appearance to the work, but prevents the lodgment of foreign substances which would accumulate, were the filling left rough.

Some of these seven considerations require comments. For this purpose the first and second may be blended together under the head of

Preparation of the Cavity.

With *dentists*, the cavity is always as thoroughly prepared as the natural laws governing the case will admit of.

With *pretenders*, various other considerations are allowed to influence the result.

Perhaps I can not make myself better understood, than by relating the particulars of one, of many individual cases falling under my observation. Several years ago, a young lady of my acquaintance, of some refinement and little means, called at my office to obtain my opinion in relation to the condition of her teeth. I found some twelve or fourteen cavities in her teeth, all of which might have been so plugged as to arrest the process of decay. I stated the fact to her. She inquired to ascertain the expense of putting her teeth in good condition, using gold with which to plug the cavities. To prepare and plug all those cavities thoroughly, would have required several days labor, in addition to an uncertain amount of gold. Of course, under these circumstances, I could not set a definite price in advance. I gave her, however, an approximate estimate of the extremes, be-

tween which, she might expect to find the true value of the services. In other words, I stated to her that the work she required, would not cost her less than $—, nor more than $—. She replied to the effect that she had for some time appreciated the necessity of having her teeth attended to; that the only reason she had delayed the matter so long, was, because she felt scarcely able to afford the expense of their repairs. "But," said she, "they must be preserved, and I will call again in a few days, prepared to have you commence work upon them." Bidding me good morning, she left my office, fully conscious of the nature and value of the work to be done. A day or two after this incident, flaming posters were conspicuously displayed about our pleasant little western village. Those posters stated that Dr. So-and-So, formerly from some large eastern city, but more recently located in a neighboring village,* would spend the first three days and three days *only*, of the next month, at the hotel in our village. The population of the village and of the whole surrounding country was most respectfully and most cordially invited to call and have their dental work done with astonishing rapidity, and at remarkably cheap rates. These flaming posters and their fair promises, very naturally attracted the attention of our young friend, who has just been introduced. Accordingly, as soon as Dr. So-and-So arrived, Miss—— called upon him, and introduced her business. A slight examination of her teeth elicited from Dr. So-and-So, the statement that he could make her teeth as "sound as a dollar,"—make them last her life time, *without any kind of trouble.* This statement paved the way for the following conversation:

Miss—. "If you are to remain in the place only three

*Just beyond our personal knowledge of business matters.

days, you will hardly have time to do my job, will you?"

Dr. So-and-So. "Bless you Madam; I can fill every tooth in your head in half a day."

Miss—. "Why, Dr. C. said it would require several days to do my job as it should be done."

Dr. So-and-So. "He did, ha. S-e-v-e-r-a-l days! Well, then of course he must charge you *several* prices, else he could not make a living. Whenever he gets so as to understand his business well enough to do a job in 'any kind of season,' he will probably be prepared to do it at a fair price."

Miss—. "What would you consider a fair price, doctor?"

Dr. So-and-So. "Well, I can fill your teeth with gold for about $—."

As his statements were made with such adroitness, and as he charged but little more than one half my estimated minimum price for filling the same cavities, it is not surprising that Miss —— congratulated herself on her good fortune, in being so opportunely provided with so skillful and so reasonable a dentist. The result was, he worked a few hours over her teeth and received her money.

About ten days after this, Miss —— came into my office, when I learned the facts above stated, from her own lips. At this time, three of the "gold fillings" had already dropped out. Miss —— expressed her surprise that they should come out so soon; "because," said she, "they certainly looked solid, and smooth." The remaining gold plugs certainly appeared to be very well burnished, and, from the mere sense of sight, no one could affirm they were not perfectly solid. An examination of the cavities and the plugs of gold which had dropped from them, however, revealed the whole mystery. A thick

layer of decaying dentine still lined the whole extent of each cavity. In other words, each cavity was more than half full of rotten bone which had never been removed. Besides this, the cavities had not been properly shaped: there had been no grooves or retaining points made. The pieces of gold which came from these cavities were light, porous or spongy pieces, with a thin stratum upon one side, formed by consolidating the particles at the surface, and burnishing. By using as large a piece of *crystal gold* as can readily be crowded into a cavity at one time, its surface can be consolidated and burnished, and still leave the greater bulk of the mass as porous as honeycomb underneath. Such must have been the course adopted by Dr. So-and-So, in filling teeth for Miss ——.

We find, therefore, that in this single instance of filling teeth, this man not only entirely disregarded the *first* and *second*, but also the *fifth* of our seven tabulated considerations. At the expiration of three months there were only two or three of those gold fillings still remaining in the mouth of Miss ——. In order to make sure of obtaining this job, Dr. So-and-So, as was his practice, bid down to about one-half of what good gold fillings would have been worth.

We will suppose, that had one of these cavities been thoroughly cleansed and filled with gold perfectly consolidated from the very bottom, it would have required *twenty grains of gold*. As the cavity was left half full of "rotten bone," only *ten grains of gold* could possibly have been consolidated in the remaining half of the cavity. As what gold was used in the remaining half of the cavity was not properly consolidated, but left in a spongy condition, only one-half of what might have been inserted, or *five grains of gold*, was actually used. Five grains in place of twenty—just one-quarter of what was really needed. As he spent no time in the preparation of

the cavity, and but little in the insertion of the gold, it must appear evident to every one that he saved a larger percentage of time, than of gold. With *one-quarter* of the expense and *one-half* of the income, it must appear evident that the profit is *doubled*. In other words, in relation to this individual case, (and the same remarks will apply to all similar cases,) Dr. So-and-So charged only *one-half as much* as any thorough and conscientious dentist would have done, and made more than *twice as much money* by the operation. As in gambling, no one person can acquire money without inflicting an equivalent loss upon some other person; so in this case, Dr. So-and-So acquired money without rendering any value for it whatever. Who sustained the loss, is not difficult to determine.

Next, as regards our third consideration—*keeping the cavity dry*.

Naturally, of course, all mouths contain both saliva and mucus; some, more than others. To prevent the cavities in the *upper* teeth, even, from being inundated with saliva or mucus, or both, requires both experience and a judicious use of napkins. To prevent inundation of the cavities of the *lower* teeth, is vastly *more* difficult. No desirable substance which has ever been used for plugging teeth can be properly consolidated in the cavity of a tooth while submerged in saliva. No "filling" inserted under such circumstances, can be long, if at all, protective. The plug will be porous, and hence not durable; and besides, under such circumstances, it must necessarily admit moisture to the dentine.

In August, 1864, at a meeting of the American Dental Convention in the city of Detroit, while this very subject was under discussion, some of the members maintained that they had found it absolutely impossible to keep certain cavities dry long enough to insert satisfac-

tory and fully protective plugs; and hence, that they were occasionally induced, if not actually compelled, to send out doubtful and unsatisfactory work done in teeth while submerged. To these statements, an experienced and honorable pioneer in the profession, from St. Louis, replied, that he never, under any circumstances whatever, allowed himself to plug a cavity while submerged. Of course, he was at once solicited to explain his particular mode of procedure in these difficult cases. His reply was short, to the point, and in the following language: "I never allow myself to plug more than one cavity in the same mouth on the same day, and when I get through I have my pay."

There, you have it, in a nut-shell. His idea is, that he will insist on having pay enough, so that he can afford to spend *all the time that is necessary* to do thorough and perfect work. This makes an *especial* point for the consideration of the reader. Patients often come "to town," do their trading, find they have "an hour to spare," and then "drop in" to get their "teeth filled." Others come prepared to give up a whole half day to the work—have a dozen or fifteen cavities to fill—want them all filled and warranted—want them filled so they never will decay again—never ache any more—want them filled for the price of half of a day's labor, their standard, &c., &c. There are persons who will fill that number of cavities, in that length of time, and for that amount of pay, (in addition to what the amalgam costs,) because they consider it lighter work than the work of common day laborers, and are just as well qualified for the one branch of business as for the other, and no better. To such patients I would say, do not treat this matter of attention to your teeth so lightly. Expend a week, or a month, if necessary, to have your teeth put in a thorough state of repair, by a skillful and *conscientious* dentist, and then cheer-

fully pay him a fair compensation for his time, labor and stock. Such a course will be *cheapest in the end*, because you will possess an equivalent for your money. Prices are only *relative terms* as compared with *conditions*. If you pay six shillings for having a hollow tooth filled, and it be inefficiently done, so as to be of no benefit whatever to you, the operation will prove an *expensive* one. You will not only sacrifice your money, but your tooth. If you pay five dollars to have the same cavity *thoroughly* plugged—five dollars to have the tooth *put in a way to be saved*, the operation will be cheap, and the investment profitable to you. I say, *put in a way to be saved*, because the best possible treatment at the hands of dentists will not save teeth without proper care on the part of the patient afterwards.

The causes which destroyed the enamel in the first place, "rotted the teeth," *must be removed*. The most skillful physician may treat a patient to perfect recovery of health; but the patient will not thereby be protected against all future attacks of disease. That depends principally upon the care, habits and conduct of the patient himself.

Next, as regards our fourth consideration—

Material.

Gold, Wood's Metal, Tin, and "Amalgam," (*silver* amalgam) or "silver cement" as it is frequently called, are the substances now in most general use for filling teeth. In addition to the four substances above mentioned, quite a number of different "composition fillings" have, from time to time, been extensively advertised by their inventors and manufacturers. Some of these compositions I have tried, and have found worthless. Others I have not tried, and, hence, shall not assume the responsibility of pronouncing upon their merits or demerits. All other

considerations and conditions being equal, gold is by far the best material for filling teeth. Gold is not soluble in any substance that a human being can hold in his mouth, hence, it is tasteless. When properly consolidated in a tooth, it is sufficiently *hard* for all practical purposes. It is durable, takes a good polish, and is not objectionable on the score of *appearance*. Gold is far more expensive* in itself, than any of these other substances. Besides this, it requires a great deal more skill, and a great deal more time, to insert perfect gold plugs, than it does to insert perfect plugs of Wood's Metal, or of Tin. It requires *vastly* more skill and *vastly* more time to insert perfect gold plugs, than it does to fill a tooth with amalgam. Notwithstanding these facts, patients who can afford the additional expense, will act most judiciously by causing their teeth to be filled with gold in all cases, where the circumstances are such as to admit of its being *properly inserted*. Of course there *are* circumstances under which, as, for instance, where a patient restricts his dentist to an insufficint amount of time, a *perfect* gold plug cannot be inserted.

When we, as dentists, can have a sufficient amount of time, and that so selected as to secure the greatest number of satisfactory circumstances, I am confident that in the mouths of *intelligent* and *ambitious* patients, we can insert a *solid gold* plug in any cavity where we can insert a *solid tin* plug or a *solid plug* of Wood's Metal.

As, however, it requires more time and more skill to insert a perfect gold filling, than it does to insert a perfect tin filling, it must appear evident to every one that certain disadvantageous circumstances might arise, under

*Gold foil, of course, always costs considerable more than its own weight; else its manufacturers could receive no pay.

which it would be possible to insert a perfect *tin* filling, and not possible to insert a perfect *gold* filling. As, for instance, taking the patient and the circumstances as we find them, it may be possible to keep a certain cavity dry long enough to insert a *perfect* plug of tin, or Wood's Metal, and not possible to keep the cavity dry long enough to insert a *perfect* plug of gold. Under such circumstances I should *most decidedly* choose Wood's Metal, or tin; because, an *imperfect* plug of gold, or of any other metal, is entirely worthless; whereas, a *perfect* plug of Wood's Metal, or of tin, in the cavity of a decaying tooth, is of *great* value—*very great*—cannot be estimated in dollars and cents. Wood's Metal, when properly inserted, makes a solid and protective filling. The same is equally true of tin. In the teeth, solid plugs of these two metals present very much the same appearance. In composition, they are essentially different; so different as to require very different manipulations in the process of insertion. In consequence of this difference, for the convenience of insertion, in a certain class of cavities tin will be preferable, whereas, in another class of cavities, Wood's Metal will be found to be preferable. If it be *impossible* to fill the cavity in your tooth with gold, or, if you can not afford the *expense* of a gold filling, cause the cavity to be properly plugged with Wood's Metal, or with tin; keep your teeth scrupously clean ever after, and you will never have occasion to regret the trouble or the expense.

"I fear, doctor, that you forget. My teeth are all artificial, you will remember."

No, no; I do not forget. I am not now speaking of your teeth individually, of course, but of teeth and patients in general. You should make a general application of all of these facts.

"As my husband has natural teeth in his mouth,

now in various stages of decay, your remarks are particularly applicable to him. Would that he might be taught to appreciate the advantages of proper care of his teeth. He has been unavoidably absent since you commenced this course of instruction; but, here he comes, now."

"Dr. C. permit me to make you acquainted with Mr. A., my husband."

(The public will here please imagine the usual salutations.)

Mrs. A. "Dr. C. has been imparting some very valuable instruction in relation to the care and preservation of the human teeth; wish you could have heard him."

Mr. A. can yet avail himself of the advantages of our conversation on this subject, as, you well know, it is to be printed. Printed, not only for his benefit, but for the benefit of innumerable others. *This is a subject which must inevitably urge itself upon the attention of unborn millions.*

I was about to speak of the claims of *silver amalgam*, or "silver cement." It must be borne in mind that mercury, or quicksilver, is a metal, and that it is in a liquid state. Who has not witnessed the experiment of trying to pick up a small globule of quicksilver? Mercury is also volatile; that is, it, like water and numerous other substances, will evaporate. Mercury readily combines with various other metals. These compounds are all designated as *amalgams*. When combined with silver, the compound is called silver amalgam. Mercury also combines with the oxygen of the atmosphere, forming *oxide of mercury*. When mercury is combined with oxygen in a certain proportion, *red precipitate*, of which you have all heard, is the result. When mercury is combined with oxygen in another proportion, the resulting compound is *black*. Mercury and sulphur combine in

two different proportions, one of which produces a *black* compound. Silver filings, or, more frequently, the filings of an alloy of silver and tin, when mixed with mercury to the consistence of putty, constitute that substance used for filling teeth, which is variously designated as "amalgam," "silver amalgam," "silver paste," "silver filling," "soft filling," "mineral cement," "lithodeon," "silver cement," &c., &c. This paste is easily inserted, and, by a chemical change not necessary to mention, becomes quite hard in the course of a few hours. Thus far it is all very well; but, unfortunately, the chemical change does not stop here. In the course of time a portion of the mercury will be evaporated. This will leave the plug porous, or spongy. Another portion of the mercury will be converted into a black oxide, already mentioned.

Sulphur readily combines with pure silver, as well as with mercury. The resulting compound is a black sulphuret of silver. If, therefore, sulphur be brought in contact with a "silver amalgam" plug, it is liable to enter into chemical combination with either or both of the ingredients of the plug, producing a black and crumbling compound. Sulphur is a natural ingredient in several common articles of food. Eggs always contain sulphur. Who has not noticed the scale of black sulphuret of silver, left on a silver spoon, after having been used in a dish of fried eggs? Who, that has worn artificial teeth mounted upon a silver plate, has not noticed the metallic taste and the black scale of sulphuret of silver upon the plate, after having worn it for a few hours, or a few days at most? One of the results of these chemical changes upon amalgam plugs, is to cause them to crumble from the teeth in a greater or less length of time. One of the effects of some of the products of these chemical changes is, through the instrumentality of absorption, or rather infiltration, to blacken the whole substance of the teeth

in which amalgam plugs are inserted. I consider a statement of the above facts necessary to candor and fairness. By this statement of facts, however, I do not intend to wage indiscriminate warfare upon all amalgam plugs, and all dentists who insert them. Amalgam, like arsenic, whiskey, dandies, corsets, has its uses, and also, like them, its abuses.

Mrs. A. "Pardon me, doctor, for the interruption; for I really can not refrain from asking, (for information, of course,) of what 'earthly use' are dandies?"

I have neither time nor space, Mrs. A., in which to answer this question further, than to state that dandies are just fitted to fill a certain niche in the economy of nature. This subject will not be omitted in my contemplated treatise on *Common Sense.* In the mouths of some persons, amalgam plugs will preserve the teeth in a very fair condition for quite a number of years. In the mouths of other persons, amalgam plugs, equally well inserted, will crumble out in the course of a few months. These different results are principally, if not entirely, dependent upon the difference in intensity and rapidity of chemical action, both upon the plugs and the teeth. In the mouths of such persons as keep their teeth scrupulously clean, constantly, these chemical changes will take place very slowly. In the mouths of such persons as are negligent about cleaning their teeth,—in the mouths of such as *never* clean them,—in the mouths of such as permit their teeth to become loosened, and their gums inflamed and swollen in consequence of accumulations of tartar,—in the mouths of such as permit shreds of meat, raisin skins, and other particles of food to lodge and remain between the teeth from one meal to another, aye, from month to month, and year to year,—in the mouths of such as, in addition to all of the above neglects, tolerate the presence of numerous decaying old roots and snags,—in short, in

such mouths as are converted into perfect cess-pools of corruption :* there are so many complex chemical changes taking place, as to destroy both teeth and amalgam plugs with astonishing rapidity. Indeed, in such mouths, the very best of *gold* plugs would make no difference with the fate of the teeth. In some almost inaccessible cavities, as, for instance, in those situated upon the back sides of the extreme back teeth, or in large shells of teeth that may be of some temporary benefit, if temporarily preserved, the use of amalgam is, perhaps, justifiable.

Whenever a more desirable and durable material *can* be used, *most certainly* amalgam *should not* be used. Filling *any good* teeth with *amalgam*, is culpable enough, in all conscience. Filling *front* teeth with it, is worse. Crowding a quantity of amalgam into two adjacent cavities in two adjoining front teeth,—crowding a quantity of amalgam, I say, into such cavities, in such a way as to fill the two cavities with one plug of amalgam,—in such a way that one end of the plug fills one cavity, and the other end of the same plug fills the other cavity, *is not one whit better than highway robbery!* In fact, it is *one degree worse than highway robbery*, for the highwayman does not stoop to the despicable practice of attempting to make his victim think he has received an equivalent for his money. Were the plug of solid gold, instead of amalgam, it would be of no benefit to the teeth under such circumstances. Whenever we bite upon a tooth, or even press upon it with the finger, the tooth is slightly moved in its socket. This motion would necessarily loosen a plug, common to the cavities in two separate teeth. Moisture would thereby be admitted to the dentine, and the process of decay would be unabated.

Mr. A. "Well, doctor, I think you and I do not

* Do not cringe, gentle reader, for there *are* such mouths!

differ in the least about the feasibility of filling teeth. I always thought it all 'moon shine,' but never had the courage to call it 'robbery,' as you do."

O, Mr. A., you are sadly mistaken about my opinion. But I have not time to explain; you will have to read attentively all the previous pages in order to arrive at a correct understanding in the premises.

Mr. A. "Best way is to pull them out as fast as they rot, and then have some 'false teeth' that will never ache, isn't it? That's my style, anyway. I never had any teeth filled, and I never allow myself to endure the tooth-ache a great while, either. My teeth come mighty hard, too, but that makes no difference; whenever they ache, they must come out. I had neighbor Dennis pull two for me last fall. He is the best tooth-puller I ever had work in my mouth,—powerful fellow, I tell you,—bought a farm right joining me upwards of twenty years ago,—has done all the tooth-pulling in that part of the county ever since,—only charges twenty-five cents,—earns his money too,—weighs about two hundred,—the first one he pulled for me last fall, the instrument slipped off three times,—last time it broke the corner of this tooth off, here, do you see? When he gets a fair hold though, something has got to come. The next tooth, he dragged me all about the room,—hav'n't had the tooth-ache since,—tried to have the nerve killed and get rid of the tooth-ache that way; but that is all 'fudge,' have tried it times enough to know,—best way is to have them out—that ends the matter."

It is but reasonable, Mr. A., that you should form your opinions from your own experiences. For the purpose, however, of answering your question, let us suppose a case. A surgeon is applied to to amputate a leg. He finds the whole foot in a gangrenous condition. He

inquires after the cause. The patient informs him that it is all from the effects of "a corn."

Surgeon. "A corn!"

Patient. "Yes, 'a corn.' I have been troubled with the miserable thing for years. It kept 'getting all worse and no better' until it ached incessantly."

Surgeon. "But what has that to do with the present condition of your foot?"

Patient. "Well, you see, doctor, I had Jack Turner put on some caustic potash to 'kill the nerve,' but it didn't do any good. In fact, it has been worse ever since."

Surgeon. "Caustic potash!"

Patient. "Yes, caustic potash; and when I found I couldn't 'kill the nerve,' I thought I would have farmer Jones amputate it with his jack knife; but the instrument 'slipped off' three or four times, and I couldn't stand it nohow."

Surgeon. "But why did you not apply sweet oil to check the destructive process of the caustic potash, and then shield and protect from irritating contact with foreign substances the deep ulcer it had caused, and thereby allow it to heal?"

Patient. "The fact is, my toes have always been of more bother to me than they have benefit; so you see, I just thought I would let it 'rot off' and get rid of it!"

Surgeon. "Are you not aware that in consequence of neglecting the gangrene in the one toe, mortification has extended to all of the adjoining toes, and, indeed to your whole foot?"

Patient. "Yes, I know it, but I don't care. I will have them all off now at once and have a 'false' foot with toes that will never ache!!"

What would you think of such a course of proceedings as I have set forth in the above dialogue?

Mr. A. "I should think it most decidedly foolish."

But is it not clearly a parallel case with the course you suggest in relation to your own teeth?

Mr. A. "I am afraid, doctor, that it is. I must investigate this matter—shall certainly read all you have written on the subject."

Well, do so, by all means, and try and be present at the rehearsal of the next lesson.

The *sixth* and *seventh* of our *seven* tabulated considerations require no especial comments, as their claims must be evident at a mere glance.

IV.

Enough has now been said in relation to the matter of "filling teeth."

That there is just as great an opportunity for deception—that there is just as much deception practiced in the insertion of artificial teeth as there is in the treatment of natural ones, most of my readers are, doubtless, prepared to believe. It is my province, however, to discuss this matter, in this connection, only so far as it bears an intimate relation to the *first* of the *two great objects* I have in view in writing this little treatise.

The growing popular belief, that of late, artificial teeth may be had almost "without money and without price," has had much to do with the present wholesale slaughter of the human teeth. Many very sensible people have been deceived into the belief that it would be cheaper (!) to have artificial teeth inserted, than to have their natural teeth repaired. Possibly it might be thought cheaper to have an old-fashioned wooden peg for a leg, than to furnish boots and shoes for the foot upon your natural leg! If you seriously think so, do not hesitate to try the experiment. If such be in accordance with your judgment, do not hesitate to act. The actions of human beings should be governed by judgment. My

judgment teaches me that the *best work* can never be furnished at *half price;* that the article which costs the least, is not necessarily the cheapest. It requires by far, more time, more skill, and better materials, to make a bureau than it does to make a dry goods box. In consequence of this fact, it requires more money to buy a bureau than it does a dry goods box. If you desire to buy a bureau at the price of a dry goods box—if, indeed, you negotiate with a mechanic *for* a bureau at the *price* of a dry goods box, you need not be surprised to find, that instead of a bureau, you *have* a dry goods box. This is but natural. Natural laws will admit of no other solution. Judgment teaches that you should so conduct yourself as to preserve your legs as long as possible. If, by any accident you should be so unfortunate as to lose a leg, do not supply its place with a stiff wooden peg; but, on the contrary, procure the most perfect artificial substitute possible. Such a course would not only be most economical, but would afford you most satisfaction. The wooden peg would be a sort of an incumberance; with it you could work but little. To say nothing about the augmented amount of comfort its use would bestow, with the assistance of the most perfect artificial leg you would be able to very soon earn the difference between its cost and the cost of a wooden peg. Judgment teaches that you should so conduct yourself as to preserve your natural teeth as long as possible. If, unfortunately, you must lose them, do not supply their places with a set at the price of a wooden peg; but, on the contrary, procure the most perfect artificial substitutes possible. Such a set will not only prove to be *cheapest in the end*, but will afford you most satisfaction.

If you negotiate with a dentist (?) for a set of teeth at the price of a dry goods box, you need not be surprised to find that you *have* a dry goods box.

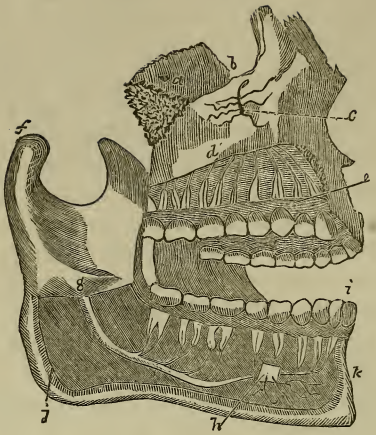
If, under circumstances where time is pressing, you discover that some dentist (?) claims to put up sets of teeth in an astonishingly short period of time, do not congratulate yourself on your good fortune. Remember that if a mechanic agrees to make you a bureau in two hours, that instead of a bureau, you will get a dry goods box. To put up a *perfect set* of artificial teeth—to mount a set so as to secure an accurate fit, a perfect articulation* and a natural expression ; requires not only experience, but time—considerable time. If a sufficient amount of time be not consumed—if your work be hurried through all the various processes for the express purpose of furnishing your teeth at little expense, you may expect to wear a set not the most comfortable, durable or beautiful. The joints will not be carefully fitted. The plate will not be thoroughly polished. The expression of the teeth will be unnatural—even if they be not clumsy, bungling, awkward, in appearance. It is true that in consequence of great improvements in science, and indomitable energy on the part of pioneer members of our profession, you can procure better artificial dentures, and at less expense, than you could have done ten or twenty years ago. In consequence of these same circumstances, however, you can now have such defective teeth treated and saved, as could not have been saved ten or twenty years ago. SAVE YOUR NATURAL TEETH.

V.

Figure 2 is intended to represent the upper and lower jaws of a human being, with sections removed so as to expose the roots of the teeth, in place, and also the small nerve branches which enter the points of each root of each tooth.

*See Appendix 1.

Fig. 2.



The two pieces of bone constituting, when united, the one firm upper jaw, are intended to be represented as slightly separated, leaving eight teeth in each half; exhibiting the outside of the teeth in the right half and the inside of the teeth in the left half. The concave portion of bone upon which the letter *a* is situated, is the *floor* of the *orbit*. The dark place near the letter *a*, represents a hole in the bone, or the commencement of the *infra-orbital canal*. At *b* is another hole, or the commencement of the *nasal duct*. At *c*, is another hole, or the *infra-orbital foramen*. Between *d* and *e*, a section of the bone is removed, exposing the roots of the teeth. Through the *infra-orbital foramen* at *c*, the *superior maxillary nerve*, and *infra-orbital artery* emerge, and, dividing into a number of branches, are distributed to the muscles and skin of the cheek, lower eyelid, upper lip, and nose. In the *spheno-maxillary*

fossa, (not here represented) small branches are given off from the *superior maxillary nerve*, which pass through small foramina in the superior maxillary bone, (upper jaw) and running forwards, supply the posterior teeth (back teeth) and gums. In the *infra-orbital canal*,—a canal in the bone extending from *a* to *c*,—two branches, the *middle dental*, and the *anterior dental* are given off, and, descending through distinct canals,* in the walls of the bone, supply the corresponding teeth and gums. Previously to their distribution, the dental nerves form a plexus† in the outer wall of the upper jaw bone, not here represented. From this plexus, nerve filaments are given off, which supply the pulps of the teeth, the gums, palate, etc. The central portion of most bones is of a porus nature. The lower jaw is composed of two hard walls of bone, with an intervening porus structure. The roots of the teeth dip deeply into this porus structure. This structure is traversed by nerves and blood vessels. The outer wall, from *g* to *h* and from thence to *k*, is removed. At *g*, is seen a representation of the *inferior dental nerve*, (a branch of the *inferior maxillary nerve*) emerging from beneath a section of the jaw which is not removed. The course of this nerve, through the central portion of the jaw, may be distinctly seen from *g*, until it is lost sight of behind a small section of the outer wall of the jaw which is represented at *h*. At this point the nerve divides into two terminal branches; the *mental* and the *incisive*. In this portion of bone is the *mental foramen*, or a hole through which the *mental branch* of the *inferior dental nerve* escapes, to be distributed to the muscles and skin of the lower lip and chin. Emerging from behind this small section of bone, may be seen the *incisive* branch,

* The *middle* dental, descends beneath the lining membrane of the antrum; and the *anterior* dental, through distinct canals, etc.

† *Plexus*, a network of blood vessels, or of nerves.

which passes forward to supply the incisive (front) teeth. Branches of the *superior dental artery*, and branches of of the *infra-orbital artery*, supply the *upper* teeth. Branches of the *inferior dental artery*, supply the *lower* teeth. These branches, though not represented in the illustration, keep in close company with the nerves already carefully described. Minute filaments of these nerves, and very minute branches of these arteries, enter, in company, the minute canals in the roots of the teeth, and commingling and interlacing in the pulp cavities, constitute the *pulps* of the teeth. As these nerves have so much to do with the matter of "tooth-ache,"—a difficulty so common and so much to be dreaded,—a few remarks here concerning their origin, and their relations to adjacent nerves, will not be without interest. In brief, the *brain* may be defined to be that organ, through the instrumentality of which, mortal beings are endowed with their senses,—are enabled to smell, hear, taste, see, and *feel*. In order that the brain may control all these various operations, it becomes necessary that it should have trusty agents to assist it, and diligent messengers to bring and carry dispatches; or, what is still better, reliable telegraphic communication with each of its agents. The nose, ears, eyes, tongue, teeth, lips, fingers, etc., may be designated as agents of the brain. The minute telegraphic wires, which enter the telegraphic offices (pulp cavities) in the teeth, have already been described.

Each agent has direct telegraphic communication with the brain, in a similar manner. The brain has *nine* lines of telegraph; or in other words, sends out *nine* pairs of nerves. The *first*, is called the *olfactory*, and is distributed to the nose. This nerve is absolutely essential to the sense of *smell*. The second is called the *optic*, and is distributed to the eyes. This nerve is absolutely

essential to the sense of *sight.* As "toothache" is the subject of discussion, we will not enumerate *all* of these nerves, but proceed at once to the *fifth*, which is called the *trifacial.* This nerve is the great sensitive nerve of the head and face. Very soon after it is given off from the brain, it divides into *three branches*, called, respectively, the *ophthalmic*, the *superior maxillary*, and the *inferior maxillary.* The last two we have already traced, with the assistance of the illustration. As these were divided and subdivided into numerous minute little nerve filaments, which were scattered in all directions, and finally lost sight of, in consequence of their extreme minuteness; so with the *ophthalmic.** Breaking up into branches, it is distributed to the skin and muscles about the end of the nose, root of the nose, inner angle of the eye, upper eyelid, forehead, temple, and indeed, to the scalp, up to the top of the head. So minute and so numerous are the nerve filaments in the skin, in which nerves of sensation terminate, that the point of the sharpest needle cannot be thrust into the skin at any place without wounding a nerve; as, the pain induced will clearly testify.

Physiologically, that is, according to the offices they perform, the cranial nerves may be divided into three classes: 1st, nerves of *special sense*; 2d, nerves of *motion*; 3d, *compound* nerves. The *olfactory* nerve, is a nerve of *special sense;* as it will transmit no other impression to the brain, than that of the *sense of smell.* The *optic* nerve is a nerve of special sense; as it will transmit no other impression to the brain, than that of the *sense of sight.* A nerve through which the influence of the brain causes a muscle to contract, and thereby raises the arm, is an example of a *nerve of motion.* The

* And all other nerves.

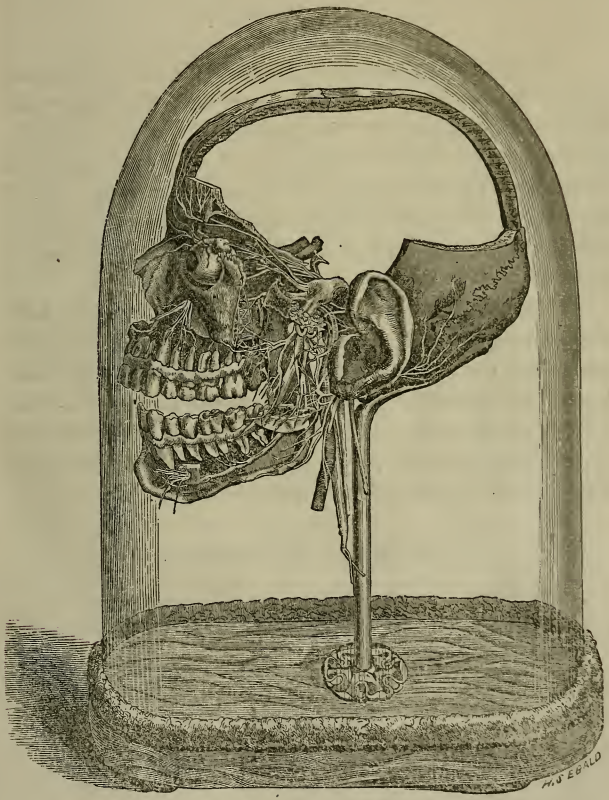
fifth pair of nerves, or the *trifacial nerve*, about which we are most interested, is an example of a *compound nerve*. Each of the branches of this nerve possesses two sets of fibres,—fibers of sensation, and fibers of motion.

"But what of all this?" the reader may ask; I will tell you. Many people have the toothache. A patient with toothache is not always a proper judge of the situation and number of teeth which ought to be extracted. Says one, "my teeth *all* ache,—*the whole side of my face and head aches*,—I want them *all* out." Another patient enters my office, points out a particular tooth, affirms that it is terribly painful, and desires to have it extracted without delay. A careful inspection of the tooth reveals the fact that it is not in the least defective. "That makes no difference," says the patient, "it aches so terribly that I cannot endure it any longer, and I must have it out." Directly opposite of this tooth, in the antagonizing jaw, I discover a loathsome "old snag," the crown being decayed entirely away, down nearly to a level with the gum. With the point of my instrument I discover that the process of decay has opened into the pulp cavity. I attract the attention of the patient to this, as being the seat of the whole trouble. The reply is, "I know all about that. That tooth has been decayed a long time; but it don't ache any,—never has,—in fact there is no pain at all in that jaw. The trouble is all in the other tooth." Any one who will give careful attention to the previous description of the nerves involved, will have no trouble in understanding why these patients are so deceived. Inasmuch as the *ophthalmic*, the *superior maxillary*, and the *inferior maxillary* nerves* are so intimately connected,—inasmuch as they are all branches of one common root,—it is not in the least surprising that

*Please turn back and carefully read the description of these nerves once more.

irritation of a portion of one of these nerves in a defective tooth, should be reflected to a corresponding tooth in the opposite jaw; or, that the pain should be so generally reflected over the region where these nerves are distributed, as to occasion severe neuralgia on the whole side of the head. The next plate represents a section of the human head, so carved, as especially to show the distribution of the *fifth pair* of *nerves*.

FIG. 3.



By referring to this plate, the reader will observe just in front of the upper part of the ear, a representation of the *main trunk* of the fifth pair of nerves. At this point it divides into three important branches; ophthalmic, superior maxillary, and inferior maxillary, which we have already sufficiently considered. By the aid of this very excellent engraving, the reader will be able to trace these three important branches to their various places of distribution.

VI.

The very youngest of my readers all know that their hair and nails are constantly growing. Their hair and nails have been cut off, and have grown out again. Why do they grow? How do they grow? What causes them to grow? These questions you cannot answer. From whence do they derive their nourishment? In reply to this question you can all understand, when I answer, from the food you eat.

How can bread, butter, eggs, potatoes and such articles of food be converted into hair and nails? Food is taken into the mouth, masticated between the teeth, swallowed into the stomach, and by various processes not necessary to mention, digested and speedily converted into blood, which circulates freely to every part of the organism. Blood is composed of thirteen *essential*

Chemical Elements.*

1, Calcium;	5, Hydrogen;	9, Oxygen;
2, Carbon;	6, Iron;	10, Phosphorus;
3, Chlorine;	7, Magnesium;	11, Potassium;
4, Fluorine;	8, Nitrogen;	12, Sodium;
	13, Sulphur.	

*Appendix 2.

Some of these substances are necessary to make bones, and some of them necessary to make muscles, and some necessary to make brains, and some necessary to make hair, and some necessary to make nails, and some necessary to make teeth, and so on, and so forth.

By a wise provision of nature, which no mortal being can understand, the bones, and the muscles, and the brain, and the hair, and the teeth, are enabled to reach out and select and appropriate from the blood as it passes by in minute capillary blood vessels, such of its ingredients as they require for their own sustenance. In short, the blood is the great fountain of nourishment from which all the waste of the system is repaired. If a man be cast upon a barren island, or from any other cause, be deprived of food, his supply of blood must cease; the bones, the brain, the muscles, the hair, the nails, the teeth, etc., can receive no nourishment, and hence, must wither and perish. If, with an abundance of food, the patient be unable to swallow, or, if able to swallow, and from dyspepsia, or other disease of the stomach, it be unable to digest the food, the supply of blood must cease, and the various organs be just as effectually starved as in the former instance. Again, the food may be ample in quantity, and yet defective in quality. Load a man's table with every conceivable variety of food, season it to his taste with the single exception of **salt*, which, in all cases withhold; and what think you, would be the result? The appetite, strength, energy, ambition—all the faculties of the victim—would gradually decline, until death would ultimately terminate the experiment. It is not my purpose, here, to trace the physiology of digestion and assimilation. I merely wish to thoroughly impress upon the mind of the reader, the fact, that the different

*Common "table salt."

organs of a living being are nourished by different substances; or, by the same substances combined in different proportions—which, in chemical language amounts to the same thing; that these different substances are all selected from one common reservoir, the blood; and that the blood is manufactured from food *necessarily* containing all of these ingredients. This much comprehended, and the reader cannot fail to understand that food might be composed of such ingredients as to very tolerably nourish some organs, and but very imperfectly nourish others.

Let us now apply these facts in a single instance, by way of illustration, to the teeth. Phosphate of lime constitutes about *two-thirds* of the weight of human teeth. If a child be continuously fed upon food very greatly deficient in phosphate of lime, strong and healthy teeth could not possibly be developed. As constant change is one of nature's immutable laws—as this law is especially applicable to organized beings—as all human beings are called upon to partake of nourishment every few hours, for the purpose of counteracting the constant disintegration of the tissues; it follows that if an adult with perfect teeth be continuously fed upon food greatly deficient in phosphate of *lime, or deficient in any other one of the ingredients necessary for the growth of the teeth, it follows, I say, that his teeth cannot possibly be maintained in a strong and healthy condition. Under such circumstances the dentine of a tooth would not only be possessed of less phosphate of lime than its best interests demand, but it would, likewise, to a greater or less extent, be deprived of vitality; it would possess less power to resist the action of foreign substances, and hence, be the more readily decayed when brought in contact with them.

* Appendix 3.

I will not attempt to trace these causes and effects further; enough has already been accomplished in this direction to conclusively establish the fact, that *there is a great natural or constitutional difference in the structure and durability of human teeth.* The general rule is, that whoever is in the best constant general health, will possess the most durable teeth. Unless disease, or a tendency to disease, be inherited, whoever lives most strictly in conformity with nature's laws, will possess the best constant general health. Whoever is most given to dissipation—whoever habitually eats improper food at irregular hours—will at once impair his general health, and sooner or later, develop gout, dyspepsia, or some other kindred disease. Warm bread, or warm biscuit with melted butter thoroughly incorporated, is quite difficult to digest; whoever makes frequent use of it, will greatly impair digestion, and in many instances, induce the worst forms of dyspepsia. In either case, the teeth will not only be insufficiently nourished, but will be attacked by the vitiated secretions of the mouth, which are generally, if not always, rendered acid in their action.

Mrs. A. "Doctor, is not the fact that my father never allowed himself to eat mince pies, hot bread, hot cakes, etc., the reason why his teeth were so remarkably preserved?

That is *one* reason; there are others. By restricting himself to a plain and wholesome diet, and taking that at seasonable and stated intervals, he did very much towards maintaining perfect health of body, and hence, of course, of all its various organs, his teeth among the rest. By the "diligent use of his tooth pick," he speedily removed all foreign substances that lodged between his teeth during his meals. As "there were quite distinct spaces between his teeth," he was enabled to keep them more cleanly by the aid of a tooth pick alone, than is the

case in most instances. With a good constitution, and such habits as preserved, rather than impaired, his digestive powers, the secretions of his mouth were natural,—were not acid, but slightly alkaline, in their reaction. Such being the conditions in his case, there was but little to cause his teeth to decay. The acid of sour apples, cranberries, and other tart articles of food, was soon neutralized by the natural secretions of his mouth, and thereby rendered harmless. In your mother's case, these conditions were entirely different. Her vitality was not great. Her digestive and assimilative powers being feeble, her teeth, like all her other organs, were but imperfectly nourished. The secretions of her mouth were vitiated. Her teeth were crowded, so that, had she been so disposed, she could not have used a tooth pick to advantage. Particles of food were allowed to ferment between her teeth, large cavities were formed, extremely sensitive pulps exposed, excrutiating pain, a foul breath and sleepless nights produced; all tending to still further exhaust the vital energies, and thereby aggravate the original morbid condition. Again, her teeth were covered with *tartar*, or "scurf," as you called it.

Tartar is a limy substance,—sometimes black, sometimes nearly white, but more generally of a yellowish brown color,—which accumulates upon the teeth. All persons are subject to this accumulation, but not alike; the tendency to collect being slight or great, according as the constitution is good or poor. Tartar is precipitated from the saliva, and deposited upon the teeth, in very much the same manner that lime is precipitated from hard water, and deposited upon the sides of the tea kettle in which it is boiled. Tartar, when first deposited, is in fine, soft particles, and usually, about the necks of the teeth, close to the gums. While in this condition, a thorough

brushing * will remove it all. If it be neglected for a considerable length of time, the tartar becomes hard and very firmly attached, so as to render its removal by a brush impossible. A single particle of tartar, once securely attached, affords a rough surface for the lodgment and attachment of other particles, so that the accumulation goes on with a constantly increasing rapidity. By this process, the tartar constantly and steadily insinuates itself between the root of the tooth and the gum, until, by its roughness and pressure, it causes the gum to become red, painful, soft, spongy, swollen, *inflamed*. As nature can not endure this unnatural contact, and furthermore, as she has no control over the tartar,—it not being organized,—she at once sets herself about removing the gum. The pressure soon becomes so great as to prevent the circulation of the blood in that portion of the gum which is in contact with the tartar, thereby causing suppuration. In other words, being deprived of blood, it is deprived of life; and the dead flesh is converted into pus,—"matter,"—corruption! So nauseating and disagreeable is the odor which some descriptions of tartar, together with suppurating gums, exhale, that the atmosphere of a whole room is contaminated by it in a few minutes! I have frequently seen this sickening corruption, exuding from beneath the edges of the gums, upon all sides, of nearly every tooth in the mouth!!

Mrs. A. "Why, doctor! please desist,—you 'turn my stomach!'"

This is no exaggeration, madam.

Mr. A. "But, doctor, what is to be done with such a mouth?"

I am confident you have not attentively read all the preceding pages of this little treatise, else you could not,

* Appendix 4.

for a single moment, harbor a doubt about what should be done with such a mouth.

Mr. A. "I am sorry to say it, though I must confess that I have not yet had time to do so."

In reply to your question, then, I have but to say, *cleanse it;* as Hercules cleansed the Augean stable, CLEANSE IT.

As no person can cleanse such a mouth for himself, let him employ a skillful dentist, and then cheerfully pay him liberally for so necessary and so disagreeable a service. If such a mouth be not cleansed,—if the tartar be not removed,—the gum will continue to recede before its encroachments; it will ultimately be utterly destroyed, either by the process of absorption, suppuration, or both. In many instances, the alveolar process of the jaw-bone itself is likewise destroyed, thereby exposing the whole length of the root of the tooth. Under such circumstances, teeth become so loosened in their sockets as to be entirely useless; and, indeed, ultimately drop out. Scores of such cases are yearly falling under my observation. With scarcely an exeption, these patients attribute these results to the use of *calomel.* Many who are not aware that they have ever taken calomel, imagine that they must have taken it as an ingredient of some patent medicine. That thorough mercurialization of the system *may* produce such results, I do not deny; but that it *is* the cause of this deplorable condition, is not true, on an average, in more than one instance out of each hundred. The public mind ought at once to be disabused of this delusion; because, until then, no effort will be made to arrest the progress of this loathsome destruction. Such a mouth can be cleansed and rendered healthy, only by extracting all *useless* teeth and roots, removing the tartar from the remaining teeth, using a cool and astringent wash upon the gums until healed, and then efficiently plugging or

treating all hollow or otherwise defective teeth. When once restored to health, no mouth can be kept so, unless the teeth be kept scrupulously clean.*

VII.

Though my great object is, and the great object of all should be, to prevent the loss of natural teeth ; still, through want of proper knowledge in the premises, it is a lamentable fact that innumerable teeth are yearly allowed to become so extensively diseased as to be vastly worse than useless. The least painful, most certain, and most expeditious method of removing such teeth, is a subject which has long perplexed the minds of both patients and dentists. Whoever possesses the best knowledge of the anatomy of the parts, together with a complete set of perfect extracting instruments, can, if sufficiently careful, skillful and experienced, remove all sorts of defective teeth, old roots, and fangs, without inflicting very much pain. Whoever undertakes to extract teeth at random—without any definite and settled plan—without a clearly defined method—will cause severe pain, and, quite as frequently as otherwise, break off the teeth, or, in some other manner, fail of accomplishing his object.

The gums about very defective teeth are necessarily more or less swollen, inflamed, and painful. A careless or bungling operator will lacerate, bruise, or compress such gums, and hence occasion excruciating pain. All who are so far behind the age as to still persist in the use of the tooth-key for extracting, will necessarily compress, and perhaps lacerate this inflamed gum most severely. Such a result must inevitably follow, for most of the force is exerted upon the fulcrum, which rests upon the inflamed

* Appendix 5.

gum. The beaks of properly shaped forceps may be thurst between the gum and the teeth, so as to firmly grasp the neck of the tooth close to the alveolar process of the jaw bone. This much accomplished, in most instances, the tooth can be easily loosened and removed, without injuring the jaw or the gum. Every successful operator must have, not a separate pair of forceps for each tooth in the mouth, but a separate pair for each class of teeth.

Some teeth have one root, some two, and others three roots each. In order to firmly grasp these teeth close down to the alveolar process, several pairs of forceps, with beaks differently constructed, according to the number and position of the roots, are necessary. To extract teeth from one jaw will require forceps with beaks differently curved, from what will be required for use upon the other jaw. The same is equally true with regard to the forceps necessary for use upon the two different sides of the same jaw. Still other pairs of forceps, and instruments entirely different from forceps, even, are necessary for the extraction of roots, fangs and fragments of teeth in different parts of the mouth. A complete and perfect set of extracting instruments, therefore, embraces quite a number of pairs of forceps. If you have defective teeth which must be taken out, and are anxious not to suffer unnecessary pain, by all means employ a dentist who is possessed of a complete set of instruments, of experience, caution, sympathy, judgment. When through, cheerfully pay him his price, even though he charge you one dollar each for extracting teeth, or roots of teeth. If you are of that class who think the money earned, always exactly in proportion to the physical strength—brute force—exerted, by all means employ a man who will drag you all around the room for twenty-five cents. If such be not in accordance with your taste, never employ

a man with an incomplete set of instruments, at any price; and if ever you find a man with a complete and perfect set, who offers to extract teeth, or roots of teeth, for less than fifty cents each, you may rest assured that he needs experience more than money, and desires your mouth to practice in.

What, it may be asked, has the science of *extracting* teeth to do with my great discovery, the principles of which, when thoroughly understood and acted upon, are destined to do so much towards the *preservation* of the teeth? In reply, I would state, that the extraction of useless teeth is only a preliminary operation; but an imperatively necessary one, nevertheless. My discovery, within itself, does not contemplate the restoration of defective teeth, but the preservation of sound ones; it does not promise to restore, but to prolong life. It is true, that if the principles of my discovery be brought to bear upon *defective* teeth, even, their existence will be prolonged; but I insist on having sound teeth to begin with, if they are to be rendered as durable as fingers and toes—if they are to be preserved until worn out, instead of being allowed to rot out. If all the teeth in the mouth are not sound, they must be made sound; the useless ones must be extracted, and the remaining defective ones plugged.

All attentive readers of the preceding pages must now possess definite ideas of the nature, cause, and effects of caries* of the teeth. The general principles of the various processes, necessary for the restoration of defective teeth and diseased mouths to a wholesome condition, have been carefully explained. Sufficient rules to enable any attentive reader to discriminate between dentists and pretenders, have also, incidentally, been given.

Having had your teeth and mouth put in a perfectly

*Decay.

sound and wholesome condition, the great consideration now is, to keep them so. You have already learned that the process of decay of teeth is simply a process of chemical combination of acids of various kinds, with the lime of the teeth. Of whatever name or origin these acids may be, their cause should be sought for and removed. No fruit which is sour enough to "set the teeth on edge," should be chewed between the teeth. If the system really need a certain amount of that particular kind of acid, it can be taken in a more dilute form. If the teeth be attacked by the acid eructations of a "sour stomach," as is generally the case; a careful attention to diet, exercise, and such other treatment, as will restore the general health of the patient, will effectually remove this cause of the decay. The acids which are most to be dreaded, because most destructive, — those which are most constantly present, are produced by the fermentation, that is, by the decay of foreign substances, lodged between and around the teeth. If, therefore, the teeth be kept constantly clean, no acid of this description can be generated. By keeping the teeth scrupulously clean, constantly, the acid secretions of the mouth, which are induced in consequence of an enfeebled or diseased condition of the general system, will be so thoroughly diluted and so frequently removed, as to be incapable of producing harm upon the teeth. Here, then, you have the whole secret of the preservation of human teeth concentrated in a nut shell; cleanliness,—keep your teeth clean,—take just as good care of your teeth, as you do of your fingers and toes, and they will last you just as long.

"But," says the reader, "that is no discovery; I was told that 'time and again,' years ago." Yes, but you did not believe it—you did not know it—you did not fully appreciate it—else, you certainly would have

acted upon the knowledge, and preserved your teeth; "actions speak louder than words," you know.

"You are quite mistaken, this time, doctor, as I have for years been very particular about brushing my teeth."

Brushing teeth and keeping teeth clean are two different things. Hundreds of persons are in the habit of brushing their teeth, where one person succeeds in keeping his teeth clean. If one's teeth be separated by quite distinct spaces, a judicious use of tooth-powder and brushes may keep the teeth sufficiently clean; if crowded, a goose-quill toothpick, and other appliances, in addition, will be indispensable. If my fair lady readers think that the habitual use of a goose-quill toothpick would be unfeminine, then I have only to reply that perhaps they might think a mouth, studded with sound, white, natural teeth, very masculine. My discovery is of incalculable value. It is also, most conclusively, a new discovery. As Franklin said in relation to his discovery: "If the ancients knew it, it must have been long since forgotten, for it certainly was unknown to the moderns," &c., &c. I say, "it is impossible that so sensible a people, under such circumstances, should have lived so long," and continually allowed their teeth to rot out, like so many old potatoes, "if they had really known that they might have" rendered them as durable as their fingers and toes, by the very simple process of keeping them clean.

I will now proceed to give a brief yet lucid description of the manner of putting my discovery in practice, without which, I fear, it would be of little benefit to the community. Some, brush their teeth once only each day, and that in the morning; this is done for the sake of personal appearance through the day, without regard for the preservation of the teeth through the night.

Others brush their teeth but once per day, and that at night; this is the wiser course of the two, for obvious reasons. Another class are very particular,—as they should be,—to brush their teeth after each meal, but frequently indulge in eating apples, raisins, figs, and other sweetmeats, in the evening, and retire for the night with particles of these delicacies closely wedged between their teeth. No attentive reader of the preceding pages can fail to fully understand the effects of such a course of conduct. Still another class are always particular to brush their teeth at proper times, but do not brush them in a proper manner. I hope that these persons will not take offense when I state that they do not know how to brush their teeth. They brush their teeth crosswise, whereas, they should brush them longitudinally.

When teeth are brushed crosswise, the friction is expended upon the most prominent parts of the teeth, which are already sufficiently clean. By brushing them lengthwise, the bristles of the brush are thrust *between* the teeth, thereby dislodging foreign particles. The first step in the operation of cleansing the teeth after a meal is to make diligent use of a *goose quill* tooth pick, for the purpose of picking out all particles of food from between the teeth. A narrow and rather soft* tooth brush, and some pure soft water should then be procured, and with these the teeth should be thoroughly brushed upon the inside as well as upon the outside; in short, upon all sides and upon the ends. Considerable experience will be found necessary, in order to successfully accomplish this without bruising the gums. As often as necessary, say about once each week, your dry tooth-brush should be gently dipped in a box of appropriate tooth-powder,† and your teeth thoroughly brushed with it upon all sides. This will be necessary in order to remove stains, discolor-

* Appendix 7. † Appendix 8.

ations, and small particles of tartar, that will be apt to accumulate in spite of your ordinary brushing. But no random brushing will quite answer the purpose; a thoroughly systematic course should be adopted in this, as in all other undertakings.

Suppose it be necessary to clean and polish a quantity of knives, forks, and silver ware in general: would it be considered efficient, or systematic, to throw the articles all in a pile, and then vigorously ply a brush upon them at random? On the contrary, the articles should be carefully looked over, and scoured or brushed just simply where they need it,—just where they may chance to have become rusty or tarnished. Just so with the teeth. They should be carefully and thoroughly looked over, as often as every two or four weeks, by the aid of a small mirror, and wherever stains or discolorations have appeared, or where tartar has accumulated, there should the friction be applied. A soft hickory stick of some five or six inches in length, should be whittled down to about the size of a large goose-quill. One end should be whittled to a point, and the other just simply flattened and bruised a little. With the ends of this stick, first dipped in water and then in your tooth-powder, you can, if sufficiently careful, cleanse any particular spot that may need this special attention, upon any particular tooth in the mouth. In short, you should be acquainted with your teeth,—you should be able to recognize them,—you should carefully look them over so often as to be able to readily detect any and all changes that may occur in any particular tooth. *Immediately* on the discovery of any cavity in your teeth you should repair to a dentist and have it securely plugged; else you can not follow my instructions. It will be absolutely impossible to keep your teeth clean so long as you have a single defective tooth in your mouth, however small the cavity. The

cavity will serve as a constant receptacle of foreign substances; and, besides, the decaying dentine alone would be sufficient to so vitiate the secretions of the mouth as to endanger all the remaining teeth.

The conditions that I have enjoined, *are imperative.* Whoever will carry them out *to the very letter*, will be repaid *a thousandfold* for all the trouble and expense incurred.

Before taking leave of this subject, I have to acknowledge that in one respect, and one only, I have deeply wronged the reader. I have been very careful to make no statement but what I believe to be true, and I have endeavored to state facts in such a manner as to be intelligible; yet, I feel that I ought to have impressed these all important facts upon the mind of the reader more forcibly. This I might have done, by charging for this *invaluable* information twenty-five dollars, instead of three. As, in accordance with acknowledged general principles, my neglect in this respect is clearly to the detriment of the reader, I most sincerely beg pardon. As a general rule, among human beings, whatever is purchased at the greatest expenditure of labor, time, or treasure, is considered the most valuable. If a lady chance to have a hat that cost but three dollars, it is roughly used and soon thrown aside, as of no consequence; whereas, whenever she pays twenty-five dollars for a hat, it is studied, and admired, and displayed, and cared for. As this principle is quite generally carried into all the departments of human life, I am fearful that on *some* occasions, at least, this little treatise will be heedlessly passed by, merely from the fact that the *great discovery* it contains costs but three dollars!

Had I charged twenty-five or fifty dollars for a full exposition of this discovery, each person purchasing would have studied, admired and heeded the advice vast-

ly more than under present circumstances. Such a course, however, would have confined the advantages of this discovery to the rich alone; whereas, one important object I have in view, is to reach and benefit the great masses of humanity throughout the whole civilized world. Do you ask "why not gratuitously publish these facts in the daily papers?" Then I will state in reply, what has already been intimated, that whatever costs nothing, is contemptuously passed by, as worth nothing. Strange, but true! Daily papers are received one day and destroyed the next.

Dr. Franklin adopted such a course as you suggest, with regard to his great discovery, but utterly failed to arrest the attention of the community. Taking advantage of his experience, I have decided to fix the price of this work at the low figure of three dollars* per copy, thereby placing it within the reach of every one; and, at the same time, avoiding the many objections which appertain to a gratuitous distribution. No person who takes interest enough in this great cause, to attentively read this little work, will, for a single moment, hesitate to pay three dollars for it. But few who take interest enough in this enterprise, to pay three dollars for this little work, will neglect to attentively read it, and be benefitted. To such as inattentively read it, or neglect to read it all, believing that no information of great value can be purchased for three dollars; to such, I say, sit right down and make out and send to me a draft for twenty-two dollars—the balance of the twenty-five—for to you, that is my price. I insist on this, more for your benefit than for mine. Three dollars, even, on large sales, will leave so much profit as to enable me to advertise extensively. I am resolved to expend every cent of the income from this enterprise, for years, for printing and advertising, in the

*Appendix 9.

hope, that ultimately, every intelligent person having teeth to save may be reached. To every reader of this little work I would say, read carefully, read attentively, read understandingly, and cause each member of your family to do likewise; and then carefully preserve for future and *frequent reference*.

One copy is intended for one family only. If you have a choice and intimate friend, a near neighbor, whose welfare you take a great interest in—if you have esteemed relatives whom you wish to render a great service, by *no means* lend them your copy of this little work; but, by *all means* persuade them to send and pay for copies of their own. One copy bought and *paid for* will be of ten times, aye, one *hundred times* the benefit to a family that a copy would which costs neither time, thought, effort, nor money. Who can estimate, who can form even an approximative estimate of the value, in dollars and cents, of a complete and perfect set of natural pearls in the mouth of each son or daughter of a family, which will, doubtless, in numerous cases, ultimately be directly traceable to the teachings of a copy of this little work? Let us all unite, then, in giving vitality to this, the most feasible plan for *effectually* and *permanently* bringing a knowledge of these facts within the range of attention and grasp of the great masses of the people. To all who are possessed of so much of this world's goods as to lead them to think lightly of all things which are cheaply purchased, I again appeal for the balance of the twenty-five dollars; and I pledge you my word that every cent of the twenty-two dollars which you are to send me, shall assist in placing as beautiful pearls as human eyes ever rested upon in the mouths of your great-grand children.

VIII.

So far as the decay of human teeth is concerned, the seeds of destruction are generally sown in the mouths of

children. Almost all parents, even those who take very good care of their own teeth, are very negligent about the condition of their children's teeth. One great reason for this neglect, and perhaps the principal reason, is founded on an erroneous opinion concerning the nature and relative values of the deciduous and permanent teeth. Nature's laws are all-wise ones. A very young infant has no teeth, simply from the fact that it needs none. As soon as a child's teeth are developed, it has use for them; and, hence, they should be cared for and preserved just so long as they can possibly be made servicable. As children of such tender age cannot take care of their own teeth, their parents should watch them and preserve them by resorting to the identical means already discussed for the preservation of the teeth of adults. By keeping the gums healthy, and the temporary teeth from decaying, your children will be securely protected from toothache; and whenever nature gets ready to replace them, she will gradually so absorb the roots of the temporary teeth, that they may easily be picked out with the fingers, or extracted with a thread. "But," says the reader, "I have seen the temporary teeth of children extracted with roots nearly as long as are the roots of permanent teeth." I have no doubt; but that only proves that through neglect the teeth were allowed to decay, and were extracted much sooner than nature intended. Whenever the temporary teeth of children are neglected and suffered to decay, the permanent teeth, so-called—the teeth of the second set—are always more or less injured, and not unfrequently seriously decayed, about as soon as through the gums. More frequently than otherwise parents argue that "it makes no difference how soon the first set of teeth rots out, as the child will have more, and better ones in the place of them." While laboring under this delusion, parents generally sit quietly by and allow "per-

manent teeth" to rot out, simply from the fact that they cannot driscriminate between teeth of the first set and teeth of the second set. This last remark of mine not unfrequently offends the dignity of parents. "Just as if I should not know whether that child of mine ever had a tooth in that particular locality before the present one!"

A boy, fourteen, sixteen, or perhaps even eighteen years of age, enters my office and desires to have a defective tooth extracted, assigning as a reason for not wishing to make any attempt to preserve it, that it is one of his first teeth, and, hence, of no account. I remonstrate, because, although one of his "first teeth," it is, likewise, one of his "permanent teeth," and if extracted, will never be replaced.

Mrs. A. "But, how is this, doctor? Do you not contradict your own statements?"

Not at all. And I may state further, that more than one-third of a full set of a full grown man's teeth are his "first teeth"—that is, they are teeth which have never had any predecessors, and teeth which will never have any successors. At from three to five years of age the temporary set of teeth in the mouth of a child is complete. This temporary set consists of just *twenty teeth*, ten upon each jaw, five upon each half of each jaw, commencing at the centre in front, and counting from before backwards upon either side of the face. There are no more than twenty teeth in the mouth of a child at this age, for the very good reason that its jaws are not long enough to admit of any more. As its jaws expand with age, other teeth are erupted, one at a time, upon each half of each jaw, directly back of these five already alluded to. These additional teeth are erupted to the number of *three* upon each half of each jaw, making twelve in all. As these twelve teeth come entirely back of all of the twenty temporary teeth, of course they take the place of

no teeth, and when once lost, are replaced by none; in short, they are truly permanent teeth. In the course of time the twenty temporary teeth are shed, and twenty permanent teeth are erupted in their places; which, added to the twelve permanent teeth back of them, make *thirty-two*, the whole number of teeth in the mouth of an adult.

The above statements are strictly correct; only, that these changes do not occur at separate and distinct intervals, as might possibly be inferred from my description. On the contrary, several of these changes are taking place in the mouth at one and the same time. There is a range of several years between the extremes of dates, at which teeth of any particular class are erupted. The eruption of the first permanent molars, for example—those teeth which come upon either side of either jaw, just immediately back of the fifth temporary teeth—sometimes occurs as early in life as the fourth year after birth, and some times not until the ninth or tenth year. So generally, however, do these teeth make their appearance at about the sixth year of age, that they have come to be spoken of and known as the "six year old molars."

Probably not more than one parent of one thousand is aware that a tooth belonging to the class of "permanent teeth" is to be found in the mouth of his or her child, at so tender an age! One reason, perhaps, why parents are so very ignorant on this subject, is because this first permanent tooth usually makes its appearance about one year before any of the temporary teeth are shed; hence, they very naturally class it with the temporary teeth. Perhaps I can make my meaning better understood by reference to

FIG. 4.*

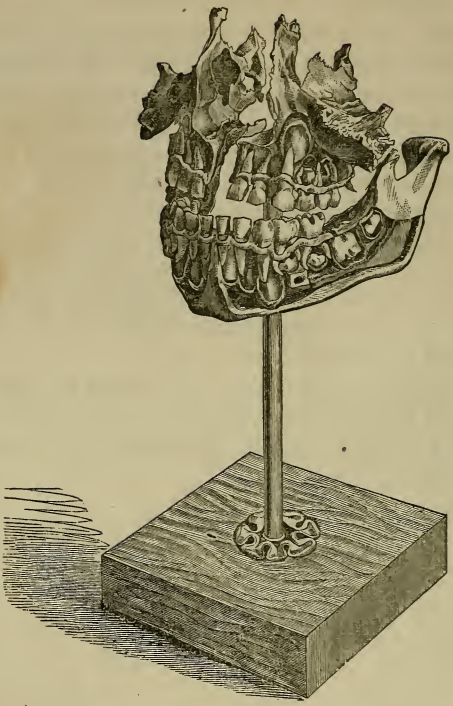
Section *A* of Fig. 4 is intended to represent the right half of the lower jaw of a child, at from three to five years of age—inside view. Section *B* is a similar section of the jaw of a child, at from five to nine years of age. Section *C* gives a view of the jaw and teeth of a child, at the age of ten or twelve years; whereas, section *D* gives a similar view of the jaw of an adult. These different sections are supposed to be placed closely side by side, in order that we may readily draw a comparison between the differences in number, size, shape, and position of the teeth at different ages.

The first tooth, just upon one side of the center of the jaw, is called a central incisor; the second, a lateral incisor; the third, a canine tooth; and the next two teeth, in the mouth of a child, (see section A,) molars, or double teeth. In section *B*, the sixth tooth, the one just at the right of the white line, is the first permanent, or "six year old" molar. Please observe that the white line is drawn across the whole four sections just at the right of,

* Appendix 10.

or just back of, the original five temporary teeth. Section *C* exhibits two permanent teeth at the right of the white line. In section *D* five fully developed permanent teeth are represented as having taken the places of the original temporary teeth; and, in addition, three permanent teeth have made their appearance back of them. The last one of these three, the eighth tooth from the center of the jaw, is called a wisdom tooth. Wisdom teeth are erupted at all sorts of indefinite periods, ranging from seventeen to forty or fifty years of age. Please observe that the *molar* teeth of the child, have been replaced by smaller teeth, and teeth of different shape, in the mouth of the adult. These teeth, inclosed between the white and black lines in section *D*, are no longer called molars, but *bicuspids;* the teeth at the right of the white line being molars in the adult mouth. Some of the foregoing changes are very beautifully and accurately illustrated in

FIG. 5.



This cut represents the jaws of a child at from three to five years of age, with sections of the bone removed; thereby exhibiting a fully developed set of temporary teeth, and the germs of permanent teeth, all in their proper places. As it happens to be most distinct in the engraving, let us direct our attention to the left side of the under jaw. Well formed incisors, canine and molars are all in place, and directly beneath each may be seen the germ of a *permanent* tooth. The two germs beneath the molars appear to be partially clasped between their

roots, so that if they should now be extracted, before their roots become absorbed, the germs might be so injured as to cause them to grow in an unnatural shape or position. For this reason, if for no other, children's teeth should be properly cared for, and not allowed to become diseased. Directly back of the fifth, or last temporary molar, may be seen the first permanent, or "six year old" molar, just ready to be erupted. This one article on the subject of children's teeth alone, is worth *one hundred times the price of the whole book*, to any parents having young children to care for; because with *them*, and *at once*, should this much needed reform commence.

APPENDIX.

1.

Teeth are said to be perfectly *articulated*, when the ends of the teeth—the grinding surfaces of the teeth—of one jaw strike upon the grinding surfaces of the teeth of the opposite jaw, in such manner, as to be of the greatest possible service in the very necessary process of masticating food. Artificial teeth cannot be so arranged without the expenditure of great care and considerable time.

2.

Chemical *elements* are *simple* substances. Two or more of these *elements* are variously combined, so as to constitute various *compound substances*. The sodium and the chlorine of the blood, for instance, are taken into the system with the food in a state of combination, so combined, as to constitute *chloride of sodium*, or common salt, "table salt." Oxygen, phosphorus and calcium are chemical *elements*; and, as you have already been informed, are among the *essential* constituents of the human blood. Phosphorus combines with oxygen in several proportions; when combined in a *certain* proportion *phosphoric acid* is produced.

When equal quantities, by weight, of oxygen and calcium are combined, *protoxide of calcium*, or *lime*, commonly called "quicklime," is produced. These two compounds, *phosphoric acid* and *lime*, also combine with each other to form *phosphate of lime*, which substance enters largely into the composition of bones and teeth. Phosphate of lime constitutes fully one-half of the weight of human bones, and about two-thirds of the weight of human teeth. Phosphate of lime is taken into the system in abundance as a necessary constituent of many articles of food, as, for instance, corn, potatoes, milk, meat, &c.

3.

Because some articles of food are deficient in phosphate of lime, you should not infer that a free use of the "phosphates" will necessarily exercise any beneficial influence in arresting the process of decay in your

teeth. If your organism will not assimilate a sufficient amount of phosphate of lime from judiciously selected food, there is not the least probability that it would assimilate phosphate of lime, if administered as a medicine. Indeed, I am convinced that the "phosphates" have been so profusely administered to persons with pulmonary consumption, as to entirely overtax all the energies of the system in its efforts to eliminate them. Under such circumstances "the phosphates" must, of course, become foreign substances, and have, doubtless, been deposited in a tubercular form in the lungs and other organs, thereby aggravating the disease they were intended to alleviate.

4.

Keep your teeth clean at all hazards; much depends upon it.

5.

Brush your teeth immediately after each meal; be sure that no food be left between them, or tartar allowed to accumulate upon them.

6.

If you have allowed your teeth to decay to such an extent, that nothing but soft, chalky, brittle fragments remain, when you invoke the aid of the dentist to have them extracted, they may crumble beneath the pressure of the forceps, and require to be picked out, a piece at a time. In such an event do not go away, and report that doctor —— "broke off" your tooth "once," "twice," or more "times before he got it out." Though such a course may make a seeming *martyr* of yourself, it does not place the doctor in an equally enviable position!

7.

A tooth-brush should not be selected which has bristles so stiff as to chafe and wound the gums. A *narrow brush* should also be selected that it may the more readily be used upon the teeth, longitudinally.

8.

The subject of tooth-powders and tooth-washes is one of great importance; though the general principles concerning them, can be summed up in a very few words. Most kind of tooth-wash,* and many kinds of tooth-powder dissolve and remove the tartar, by virtue of acids they contain. The reader will readily understand why such preparations should never be used. Many people use finely pulverized charcoal.

* Do not here confound an *acid tooth-wash* with an *astringent*, *mouth* or *gum-wash*.

There are, at least, two great objections to its use. Pulverize charcoal as thoroughly as is possible, and still its particles are sharp and angular. They will effectually remove the tartar, but, at the same time, they scratch, wear and damage the enamel. The other objection consists in the fact that these particles become securely lodged between the edges of the gums, and the necks of the teeth, thereby forming unsightly black specks, or even streaks, according to the quantity lodged.

A tooth-powder should be composed of such ingredients, so combined as to render the whole pleasant to the taste, agreeably fragrant, slightly alkaline, slightly astringent, and of so slight a grit, as to cause no detrimental friction upon the enamel. In the process of manufacture, it should be reduced to an *impalpable* powder, and sifted through a very fine sieve. Of tooth-powders possessing these properties, I may mention, as having fallen under my observation, that prepared and sold by Samuel S. White, of Philadelphia; Allport's, of Chicago; and Stearns', of Detroit. In this connection, I desire to state that cuts No. 3 and 5 are imprinted from electrotypes, taken from original wood engravings procured by S. S. White, for the purpose of advertising actual anatomical preparations, kept for sale by himself. Through his kindness I was furnished with the electrotypes, for which he will please accept my thanks.

9.

Price per dozen, to dentists and book-dealers, made known on application.

10.

For the design of this cut I am indebted to the second number of volume one, of the People's Dental Journal. This valuable journal was formerly published at Chicago, and was replete with matter of great value to every person having teeth to be preserved; but, for want of sufficient patronage, its publication has been discontinued. As it was published for the express purpose of instructing and benefiting the great masses of the people, and was sold at cost, its failure affords another striking proof of the impropriety of attempting to fully awaken the attention of the community to the value of any great and important discovery, or improvement, in any sort of a gratuitous manner. As regards knowledge and merchandise, at the present time, at any rate; men really *appreciate* only that which they *buy* and *pay* for.

11.

As soon as the professional and other duties of the writer will admit, he intends to issue a work entitled Common Sense for the Million.

Now, patient reader, do not smile at the magnitude of my subject. I do not expect to exhaust it; shall not attempt to; have no desire to do so. All I intend to do is, to confine myself to what I conceive to be *common sense views* of the subjects under discussion.

My principal subject for discussion will be, *Health, and the mode of preserving it.* This subject will, of course, involve a consideration of the food we eat; the air we breathe; the clothing we wear; the hours we sleep; the work we do; the recreations we take; the associates we encourage; the books we read; the medicines we take; and numerous others, needless to mention here. The proper management of children, as well as their mismanagement, in relation to health, will receive a fair share of attention. The merits and demerits of different systems of medical practice, and the *uses* and *abuses* of different medicinal substances, in the hands of practitioners as well as in the stomachs of the masses, will also receive attention.

The mutual relation of physician and patient will claim attention. This subject will involve a consideration of pecuniary and other business matters, as well as matters strictly professional.

In short, it is intended to make the work a thoroughly practical one; one which, considering its subject, will appeal to the attention of *all.*

Be on the watch, then, for advertisements in relation to the work entitled,

"COMMON SENSE FOR THE MILLION,"

BY

G. E. Corbin, M. D.